Objective. This paper describes the incorporation of a diabetes camp into the experiential pharmacy education program at the Texas Tech University School of Pharmacy.

Methods. Students on the clerkship attended a weeklong diabetes camp where they were responsible for the care of 5 to 9 children. Before attending the camp, the students prepared to perform the following tasks: preparing and administering insulin, performing blood sugar testing, providing diabetes education to children, participating in meal planning and carbohydrate counting, treating hyperglycemia and hypoglycemia, adjusting insulin regimens, managing insulin pump therapy, and describing how diabetes may affect a child’s quality of life.

Assessment. Evaluations of the clerkship experience have been positive and student interest has increased over time.

Conclusion. The use of pediatric diabetes camps as an experiential clerkship site for pharmacy students is educational and rewarding and has enhanced the visibility of the pharmacy profession.

Keywords: camp, diabetes, clerkship, pediatric, advanced practice experience

INTRODUCTION

The impact of a chronic disease on a patient’s quality of life is a difficult concept to teach and learn in an academic environment. While pharmacy students may learn how to adjust insulin doses, they rarely learn how it feels to schedule their day around checking blood glucose values, counting carbohydrates, and giving themselves insulin injections. Diabetes camps educate participants (campers) and volunteers on the self-care skills needed to properly manage their diabetes. Reports in the literature describe camps as clinical sites for nursing students, but nothing has been published describing the role of pharmacy students. One article in the nursing literature stated that pharmacy students were also volunteering at the camp they attended, but no details were given.

In 1999, an endocrinologist asked the faculty of the School of Pharmacy at the Texas Tech University Health Science Center (TTUHSC) if they, and their students, would be interested in attending a diabetes camp as medical counselors. One faculty member interested in pursuing this began to offer diabetes camps as clerkship sites for fourth year pharmacy students to provide unique educational experiences and a better understanding of childhood diabetes. This paper describes the incorporation of a diabetes camp into an experiential pharmacy education program.

METHODS

Two diabetes camps were being used as experiential sites. The first camp experience was 1 week long in conjunction with a required pediatrics clerkship that was 6 weeks in duration. The second camp was 9 days long and was part of an elective clerkship. The duties required of students and faculty members while at the camp are listed in Table 1. A precamp curriculum prepared the students to perform these duties. Table 2 includes topics that were studied before camp and the method of information delivery. A faculty member worked with the students to assure that they had mastered each of the content and ability areas. When students completed the camp as an elective, more time was devoted to preparing patient education materials and participating in pediatric ambulatory clinics and discussions. Students who attended the camp as part of their pediatrics clerkship were concurrently responsible...
Table 1. Pharmacy Student Duties While at a Diabetes Camp

<table>
<thead>
<tr>
<th>Duties</th>
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<tbody>
<tr>
<td>• Blood glucose monitoring and recording four times daily and other times as needed</td>
</tr>
<tr>
<td>• Observation or administration and recording of all insulin doses</td>
</tr>
<tr>
<td>• Ensure adequate carbohydrate intake by all children at meals</td>
</tr>
<tr>
<td>• Provide medical supervision at all activities. This includes provision of first aid and checking blood glucose values when the patient is acting or feeling abnormal.</td>
</tr>
<tr>
<td>• Treat hypoglycemia and hyperglycemia</td>
</tr>
<tr>
<td>• Check blood glucose values at midnight or 2 AM in children with abnormal bedtime values</td>
</tr>
<tr>
<td>• Provide diabetes education in three structured sessions and continually</td>
</tr>
<tr>
<td>• Assess the camper’s self-care abilities and knowledge of diabetes</td>
</tr>
<tr>
<td>• Identify patterns of blood glucose values that might require insulin adjustments</td>
</tr>
<tr>
<td>• Meet with parents at the conclusion of camp to discuss their child’s week and any adjustments that were made to their insulin regimen</td>
</tr>
<tr>
<td>• Check-in medications for all campers. This includes assuring accurate labeling and administration times, verifying allergies, and preparing medication administration records for daily use at camp.</td>
</tr>
</tbody>
</table>

Table 2. Pre-Camp Curriculum in Preparation for a Diabetes Camp

<table>
<thead>
<tr>
<th>Topic</th>
<th>Educational Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathophysiology of Type 1 and 2 diabetes</td>
<td>Discussion with preceptor</td>
</tr>
<tr>
<td>Mixing and administering insulin</td>
<td>Each student must demonstrate appropriate mixing, measuring, and injection technique.</td>
</tr>
<tr>
<td>Insulin pharmacokinetic profiles</td>
<td>Discussion with preceptor</td>
</tr>
<tr>
<td>Adjusting insulin doses</td>
<td>Completion of multiple insulin dose adjustment exercises with case discussions.</td>
</tr>
<tr>
<td>Signs, symptoms, and treatment of hypoglycemia and hyperglycemia</td>
<td>Discussion and assessment questions.</td>
</tr>
<tr>
<td>Insulin pump therapy</td>
<td>Student reads text and completes a multiple question assessment. Hands-on two-hour demonstration of insulin pumps delivered by an insulin pump manufacturer.</td>
</tr>
<tr>
<td>Carbohydrate Counting</td>
<td>Student prepares a meal plan and counts and records carbohydrate intake for one week. Common camp meals and their carbohydrate content are discussed.</td>
</tr>
<tr>
<td>Diabetes education</td>
<td>Student prepares and delivers an interactive diabetes education session</td>
</tr>
<tr>
<td>Treatment of Type 2 diabetes in children</td>
<td>Discussion and Jeopardy session</td>
</tr>
<tr>
<td>Blood glucose monitoring</td>
<td>Student demonstrates proficiency with various blood glucose monitors and lancets and performing fingersticks</td>
</tr>
<tr>
<td>Camp policy and procedures</td>
<td>Camp manual, discussion</td>
</tr>
<tr>
<td>Effective communication with children</td>
<td>Discussion with preceptor</td>
</tr>
</tbody>
</table>

for patient care in the hospital requiring after-hours discussions to cover the precamp materials.

At camp, each student was assigned responsibility for a group of 5 to 9 children under the supervision of a physician, pharmacist, or certified diabetes educator. A typical day at the camp was 17 hours long, with the students responsible for the continual supervision of the children during each activity and meal. Students provided daily diabetes education to the campers. At the conclusion of camp, students met with the parents of their assigned children to discuss the week and any changes made to the child’s insulin regimen. At least
one faculty member is required to attend the camp so that students may get internship hours for the experience. Typically, the faculty member performs the same duties as the students, with the added responsibility of adjusting insulin doses for the children.

Grading was based on professional performance, development of patient educational materials, and completion of a paper describing the experience. A standard form was used for all clerkships at the School of Pharmacy to assess professional performance. The assignment descriptions and grading forms developed for the patient education and writing assignments are available from the author by e-mail upon request. Students completed 2 evaluations of the experience; one was developed specifically for camp and the other was a standardized evaluation used for all clerkships.

RESULTS

To date, 18 students from the TTUHSC have attended the diabetes camp. Because of state board of pharmacy requirements, only 3 students can receive internship credit under the supervision of one preceptor. Therefore, the number of students who can attend camp is dependent upon the number of preceptors who are able to attend the camp. Typically, there have been 2 preceptors at each camp, allowing 6 students to attend.

By the conclusion of the experience, all students demonstrated competency in each of the clerkship objectives. Comments and evaluation scores were positive and are listed in Appendix 1. Four of the students have returned to camp as medical counselors after graduating from pharmacy school. One of the students currently works as a pharmacist in a pediatric endocrinology clinic and 2 others are pursuing pediatric specialty residencies. Feedback from physicians and nurses at camp has been positive, with continued requests for medical counselors from the pharmacy school.

Patient education materials developed prior to camp were well received by the other medical counselors as well as by the medical director at camp and were used by many to educate their children. Examples of educational materials developed include several games (diabetes crossword, word find, and tic-tac-toe) and a model for injection site rotation.

DISCUSSION

The use of diabetes camps at the TTUHSC School of Pharmacy has been successful. There are some issues to consider when establishing clerkship sites in a camp setting. Many camp personnel may be unfamiliar with the role of the pharmacist or pharmacy students in the camp setting. This was the case with each of the camps we currently use. Before selecting a camp, one should discuss the role of the pharmacist and pharmacy students with the medical director and assure that the student’s educational goals will be met. It may also be beneficial for a faculty member to attend the camp before any students do in order to assess the site and better define pharmacy’s role as camp staff. To enhance the student’s experience, having a pharmacist preceptor in the cabin with them would help facilitate learning. This may not be feasible depending on the number of faculty who are interested in attending camp.

Another consideration should be for the structure of the clerkship when students are not at camp. This would include determining the number of hours a student needs to accumulate for the duration of the clerkship. Currently, we count the number of hours the student is awake at camp as their contact hours. This typically equals 90 to 120 hours for a weeklong camp. It could be argued that because the students are staying in cabins with the campers, they are essentially on call and all hours while at camp should count toward academic credit. However, in the state of Texas, a student cannot receive credit for more than 50 intern hours each week. The number of hours a student needs outside of camp will depend on state laws and the credit hours assigned to the clerkship. With discussions, readings, and assignments the students accumulate approximately 20 hours per week. Other experiences such as pediatric ambulatory clinic attendance are used to accrue additional hours.

Camp experiences should be considered elective rather than required. The camp setting requires that the student exert considerable effort and have an interest in caring for children. Students are given great responsibility that cannot be taken lightly. Care should be taken to select students who will be dedicated to the experience.

The presence of our students and faculty at these camps has improved others’ awareness of the value of pharmacists as part of the health care team. After attending camps the first year, medical directors commented that they were not previously aware of the knowledge base and abilities of pharmacists. They have since commented that the pharmacy students and faculty have become a highly desired group of medical counselors.

Resources are available to assist anyone interested in investigating the possibility of using medical camps as clerkship sites. An initial starting place would be to ask local endocrinologists if there is a camp in the area.
for children with diabetes. The same could be done for other subspecialties including asthma, HIV, epilepsy, and cancer. A website is available which lists diabetes camps in America as well as the American Diabetes Association’s position paper on the management of diabetes at camp. The American Camping Association (ACA) is an accrediting body for camps and a list of all accredited camps is available on their website. Many camps are not ACA accredited or do not advertise on websites; therefore, to find a camp in a specified geographical area, one should talk to local physicians or support groups for more information.

CONCLUSIONS

The use of pediatric diabetes camps as experiential clerkship sites for pharmacy students has proven to be educational and rewarding and has enhanced awareness of the pharmacy profession. This is a unique and effective way to teach students about managing and living with diabetes.

ACKNOWLEDGEMENTS

We are grateful to Dr. Michael Bourgeois and Dr. Stephen Ponder, medical directors for the diabetes camps we have attended. To all of the students and residents who have attended camp, thank you for your hard work and constructive comments. Thanks also to Dr. Allyson Gaylor, Dr. Lisa Lubsch, Dr. Lea Swan-son, and Dr. Joan Reilly for helping to precept students during their camp clerkships.

REFERENCES

Appendix 1. Student Evaluations of a Diabetes Camp Clerkship

Student Evaluation
On a scale of 1-5 (1 = strongly disagree, 5 = strongly agree)
The scheduled study sessions before camp were beneficial 4.2
I feel comfortable adjusting insulin regimens 4.6
I am knowledgeable about insulin dependent diabetes in children 4.2
I would recommend this camp to other students 4.8

What did you like MOST about your diabetes camp experience and why?
- Hands down, it was the educating of my girls. I enjoyed being able to teach them, watch them grow and see their accomplishments at the end of the week.
- The education of seeing the kids and their reactions to varying blood sugar levels.
- I learned a great deal in regards to diabetes but most of all how to deal with the pediatric population. I understand the sensitivity that some of these kids may go through, which before I came I had no idea.
- Learning from the kids, having both high and low BS, what to do when, why BS drops/raises (activity, food, skit, etc)
- Providing EDUCATION, and the kids being interested
- I really enjoyed working with the kids. Teaching each kid how to properly draw up insulin and how to give shots was an experience. Also, I enjoyed teaching each camper a little about his or her disease state, i.e. carb. counting, ways to avoid complications, and how insulin works.
- Great way to learn.
- I really enjoyed being with the kids and being able to teach them more about their diabetes.
- Learning about diabetes was easier due to hands on experience provided under the supervision of experienced medical staff. This experience is difficult to find in a non-teaching hospital. The camp environment was relaxing and enjoyable.
- I liked med-ed. For me, to teach something means I know it really well.
- I liked interacting with the campers. They taught me a lot about living with diabetes.
- What I enjoyed most was the interaction with the children during the med ed sessions. I was amazed at the knowledge that most of them already had, even those that had been diagnosed as little as 3 months prior to camp. Likewise there were other children that did not have much knowledge at all. The discussions that were started by the prepared med ed’s helped both groups of children as well as improving my knowledge and understanding of the disease.
- I liked having my specific 5 girls that I was responsible for and then a team that I worked with and could ask advice of.
- The kids, being a positive influence/role model, having fun, and educating them on their diabetes at the same time.

What did you like LEAST about your diabetes camp experience and why?
- WHEN MY GIRLS FOUGHT!!! 10 and 11 year olds for 1 week in 1 room – yikes. One doesn’t realize what all it entails to manage it appropriately. Lots of attention and time is required to manage it properly.
- Saying goodbye on Saturday almost broke me...that was tough.
- Babysitting during all times, but you did get to know the campers that way. Frustration in not changing regimens when it was clearly needed.
- I have absolutely no complaints, except I think that the family should bring their logbook. That way we can truly evaluate their glucose levels and make a clinical decision.
- Lack of sleep, but I guess it comes with the territory.
- I think a week camp experience was short. I would have liked to do the two weeks because it would have given me more experience in insulin adjustments.
Appendix 1. Student Evaluations of a Diabetes Camp Clerkship (Continued)

What is the most valuable thing you learned from diabetes camp?

- Oh where do I begin...onset, peak and durations of the various insulins, pump ed, where to and how to give injections, the importance of site rotation, technique of drawing up insulin, and the importance of diet and hydration. You really can’t beat first hand experience – which is exactly what you get at camp.
- The importance of following a strict diet and monitoring in order to save your life.
- Everything.
- Kids perspective of their disease!!!!
- Many people think that children with diabetes are different from other people. I believe that one of the most valuable things I learned is that children with diabetes are no different than the next person and with proper glycemic control, they will lead a healthy lifestyle just like anyone else.
- The most important thing I learned at camp, which I may not have learned anywhere else, was about insulin pumps. I may still not be an expert, but I have had first hand contact with them, putting me a step ahead of fellow students/pharmacists who have never even seen a pump.
- Once kids are encouraged about their disease they become an active participant in treating any types of episodes.
- Insulin regulation/meal planning
- How to count carbs and adjust insulin pump doses. How to deal with children with diabetes, not only from a medical perspective, but also as their friend.
- Life is precious and should be enjoyed. These children have taught me how to be grateful for what you have and not what you don’t have.
- To treat hypoglycemia quickly and accurately. I also, feel much more confident about changing insulin doses.
- I learned that some patients are much more sensitive to Humalog® than others and that hypoglycemic reactions can be very serious.
- Each child is an individual. Blood glucose readings are important, but it is more important to treat the child than treating a number. There were some children that would begin to feel low and shaky with BG in the 120-150 range, and some children in the 40’s that did not feel low. Watching the children and learning their personalities was extremely important.
- This was really my first exposure to childhood diabetes, and I learned that it is quite different from the type II diabetics that I see a lot at the hospital and the clinic.